

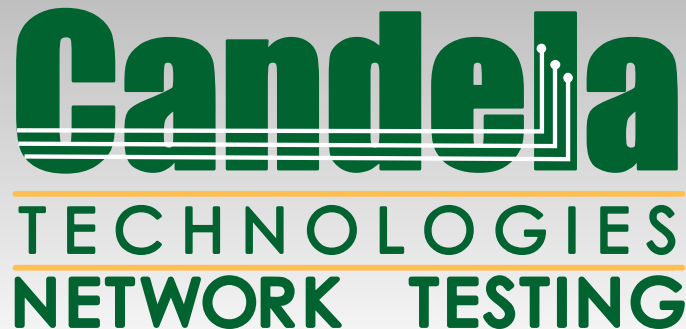
LANforge WiFi Demo

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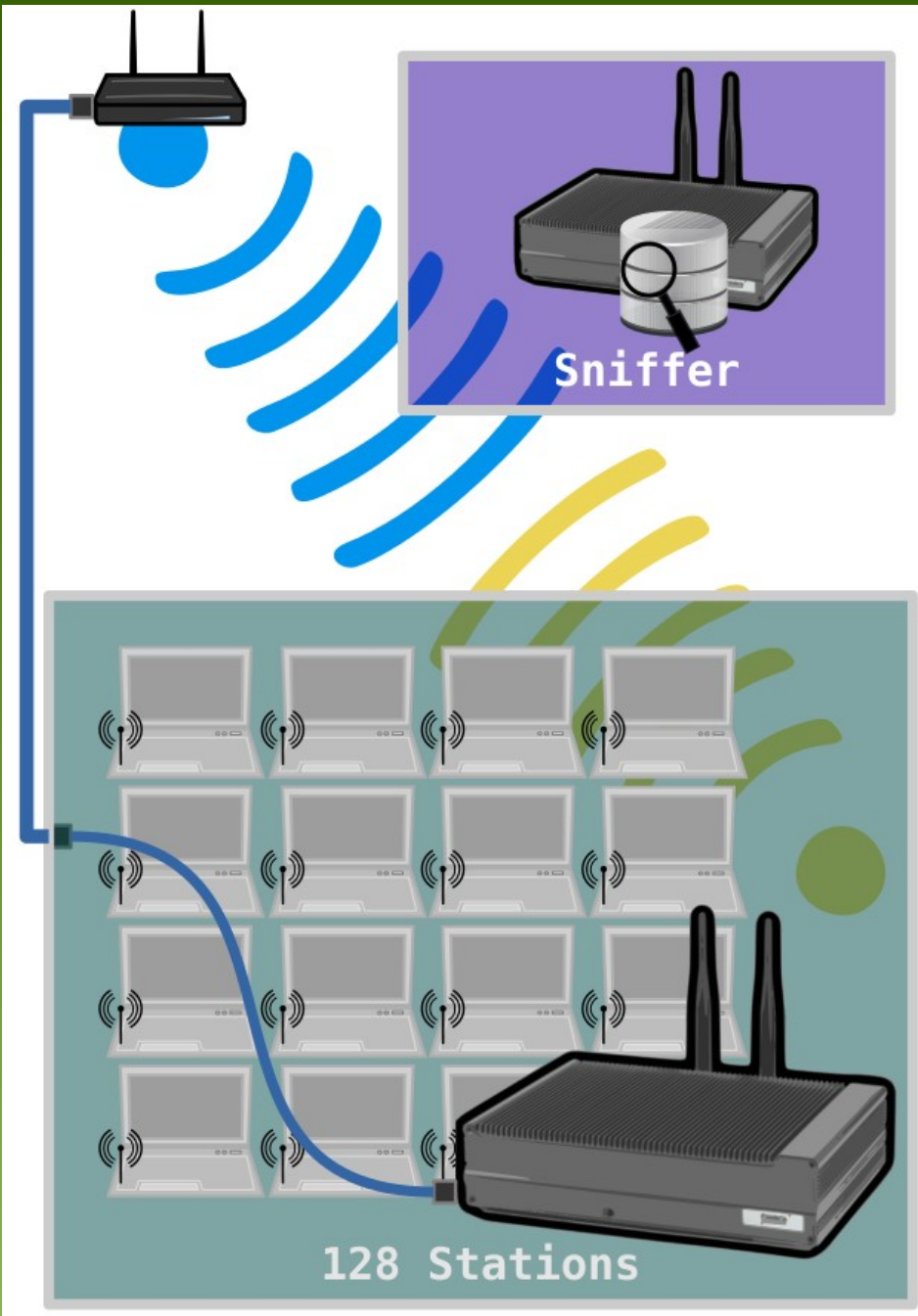
WiFi Capacity Test

- Test throughput and functionality for different numbers of active stations.
- Equipment: AP, LANforge
- LANforge example configuration steps:

<http://www.candelatech.com/cookbook.php?vol=wifire&book=WiFi+Capacity+Test>

Configure Test

- Select Port-Mgr tab in LANforge GUI
- Create and select Station interfaces.
- Add eth1 port if doing upload/download test.
- Or, can do station to station testing.
- Or, can test against upstream web server.
- Right-click → WiFi Capacity Test
- Configure values, click 'Start'.



LANforge Manager Version(5.2.11)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

File-I/O Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators Collision-Domains

Disp: 10.1.0.14:0.0 Sniff Packets Clear Counters Reset Port Delete

Rpt Timer: faster (1 s) Apply View Details Create Modify Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

Port	Pha...	Down	IP	SEC	Alias	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	P
1.1.000	<input type="checkbox"/>	<input type="checkbox"/>	192.168.100.26	0	p33p1	51,695,...	60,897,...	112	407,049	57,672,...	60,371,...	
1.1.001	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.165	0	sta0	290,172	2,116	0	0	10,254	67	
1.1.002	<input type="checkbox"/>	<input type="checkbox"/>	0.0.0.0	0	wiphy0	343,142...	658,158...	4	4,788	7,669,3...	245,012...	
1.1.003	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.97	0	sta1	451,480	2,962	0	0	6,848	30	
1.1.004	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.101	0	sta2	356,278	2,405	0	0	6,596	30	
1.1.005	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.169	0	sta3	376,532	2,622	0	0	5,400	26	
1.1.006	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.103	0	sta4	334,364	2,276	0	0	5,364	26	
1.1.007	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.166	0	sta5	371,362	2,577	0	0	4,396	24	
1.1.008	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.168	0	sta6	388,362	2,669	0	0	5,038	25	
1.1.009	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.84	0	sta7	385,616	2,524	0	0	5,762	27	
1.1.010	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.87	0	sta8	385,106	2,513	0	0	5,454	27	
1.1.011	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.114	0	sta9	445,840	2,928	0	0	5,364	26	
1.1.012	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.116	0	sta10	287,894	2,045	0	0	5,002	25	
1.1.013	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.107	0	sta11	340,708	2,320	0	0	6,234	29	
1.1.014	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.111	0	sta12	376,872	2,558	0	0	6,234	29	
1.1.015	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.118	0	sta13	337,682	2,351	0	0	5,734	27	
1.1.016	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.167	0	sta14	301,682	2,203	0	0	3,916	22	
1.1.017	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.120	0	sta15	360,972	2,504	0	0	5,762	27	
1.1.018	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.82	0	sta16	331,172	2,168	0	0	4,640	24	
1.1.019	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.100	0	sta17	399,290	2,609	0	0	5,872	28	
1.1.020	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.123	0	sta18	384,792	2,614	0	0	4,530	23	
1.1.021	<input type="checkbox"/>	<input type="checkbox"/>	10.26.2.126	0	sta19	410,700	2,750	0	0	5,872	28	

Logged in to: 192.168.100.26:4002 as: Admin

WiFi Capacity Test

Station Increment:	Single (1)
Loop Iterations:	Single (1)
Duration:	10000
Protocol:	UDP-IPv4
Layer-4 Endpoint:	
Payload Size:	UDP Pld (1,472 B)
Total Download Rate:	500Mbps
Total Upload Rate:	Zero (0 bps)
Socket buffer size:	1MB (1 MB)
IP ToS:	Best Effort (0)
Multi-Conn:	0
Per-Second Reporting Interval:	3-second Running Average
<input checked="" type="checkbox"/> Show Pie Charts	<input type="checkbox"/> Try Lower Rates
<input checked="" type="checkbox"/> Show Per Loop Totals	<input checked="" type="checkbox"/> Show Events

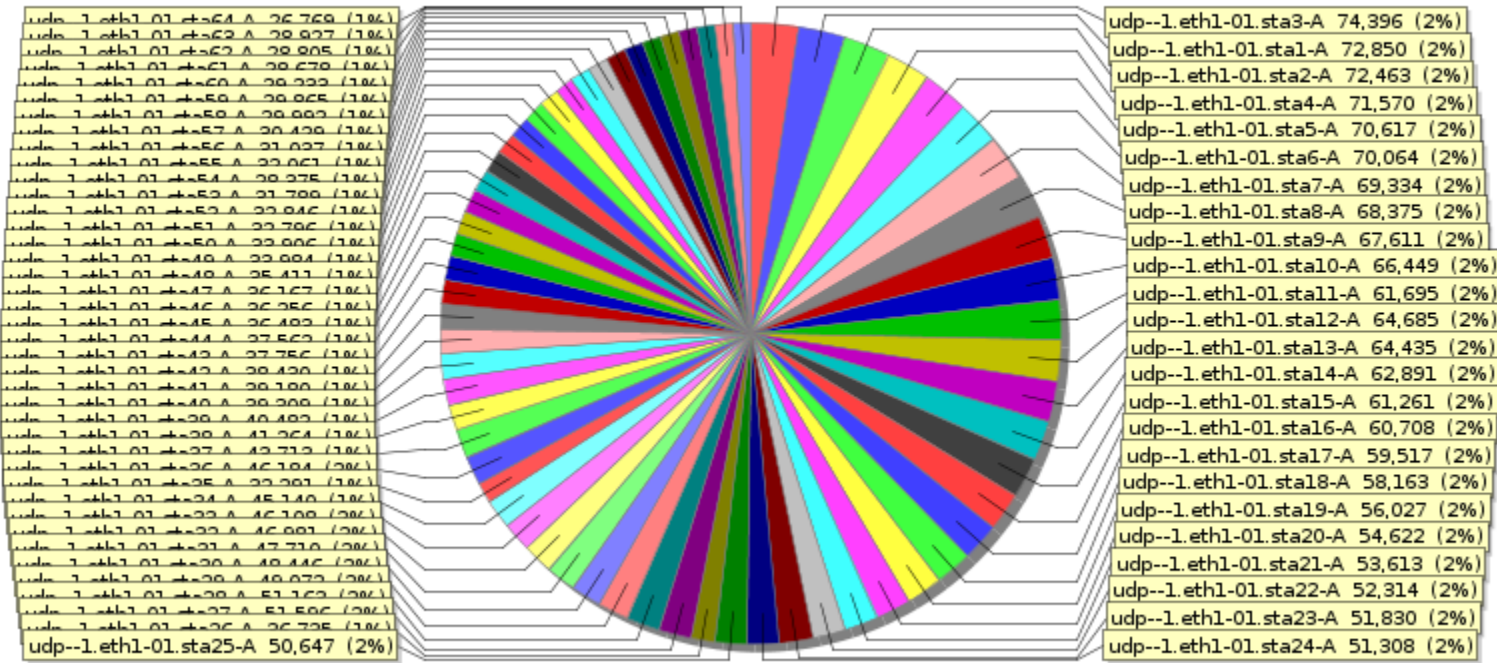
Ports Selection

Ports in Use		Free Ports
1.1.3 eth1#0	← Add Ports	1.0.0 eth0
1.1.6 sta1000		1.1.0 eth0
1.1.8 sta1001	Remove Ports →	1.1.1 eth1
1.1.9 sta1002		1.1.2 eth0#0
1.1.10 sta1003		1.1.4 sta0
1.1.11 sta1004		1.1.71 wlan1
1.1.12 sta1005		1.1.72 hwsim0
1.1.13 sta1006		1.1.73 wlan0
1.1.14 sta1007		1.1.74 wlan2
1.1.15 sta1008		1.1.75 vap50

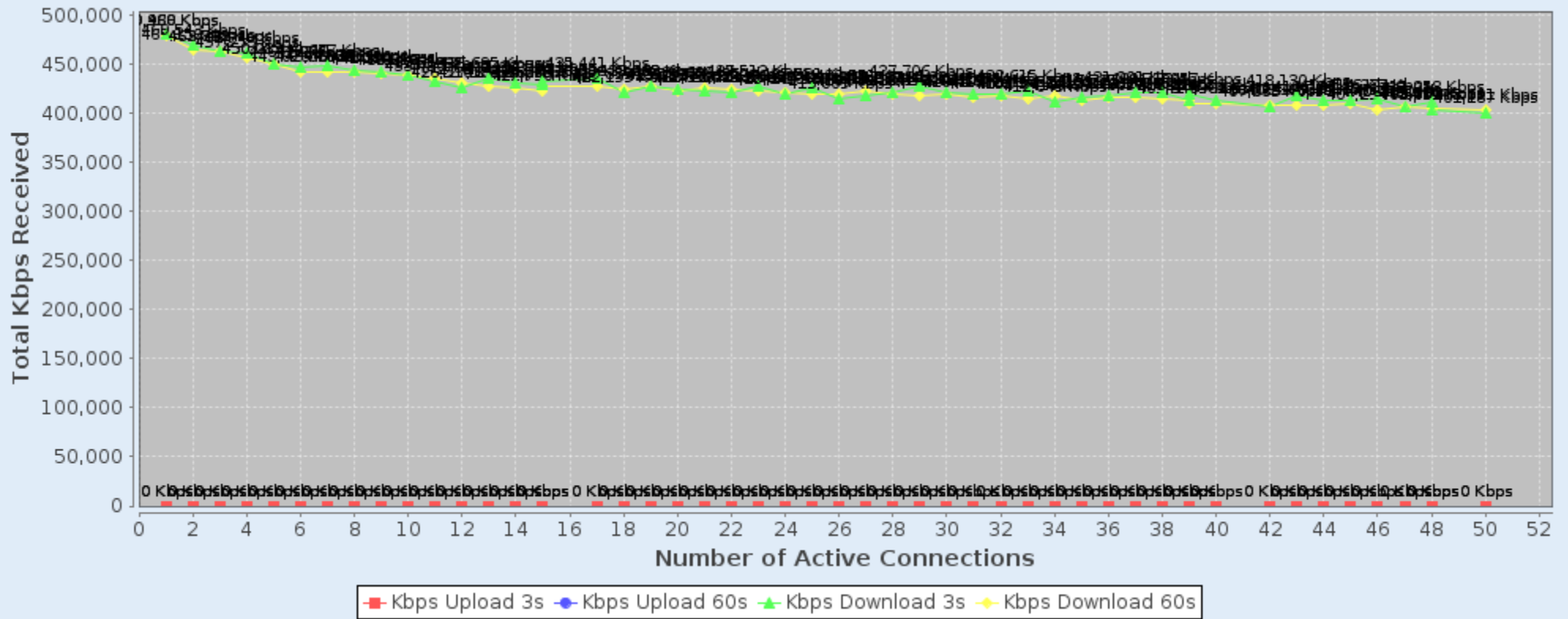
Start

Close

Download Received Kbytes, for entire 1 m run



Total Kbps Received vs Number of Connections Active



Sniff WiFi Packets

- Set wiphyX to requested channel.
- Create dummy vAP to enforce channel binding.
- Select wiphyX interface and click 'Sniff Packets'.
- Must be using 'remote desktop', 'vnc', or be otherwise running GUI on a system supporting the X-11 desktop protocol.



Filter: Expression... Clear Apply Save ibss-cros ibss-no-beacon ibss-no-beacon ibss-ath10k

No.	Time	Source	Destination	Protocol	Length	Info
2935	0.510883000	CompexPt_26:21:3a (TA)	CompexPt_c0:23:2c (RA)	802.11	54	802.11 Block Ack, Flags=.....
2936	0.511092000	66.1.1.4	65.1.1.135	LANforge	4634	Seq: 104229267
2937	0.511112000	66.1.1.4	65.1.1.135	LANforge	4634	Seq: 104229270
2938	0.511124000	66.1.1.4	65.1.1.135	LANforge	4634	Seq: 104229300
2939	0.511156000	CompexPt_26:c1:3a (TA)	CompexPt_c0:23:2c (RA)	802.11	54	802.11 Block Ack, Flags=.....
2940	0.512953000	66.1.1.4	65.1.1.184	LANforge	1572	Seq: 52490734
2941	0.512972000	66.1.1.4	65.1.1.184	LANforge	1572	Seq: 52490735
2942	0.512981000	66.1.1.4	65.1.1.184	LANforge	1572	Seq: 52490736
2943	0.512989000	66.1.1.4	65.1.1.184	LANforge	1572	Seq: 52490737
2944	0.512998000	66.1.1.4	65.1.1.184	LANforge	1572	Seq: 52490748
2945	0.513005000	66.1.1.4	65.1.1.184	LANforge	1572	Seq: 52490749
2946	0.513013000	66.1.1.4	65.1.1.184	LANforge	1572	Seq: 52490750
2947	0.513019000	66.1.1.4	65.1.1.184	LANforge	1572	Seq: 52490751
2948	0.513026000	66.1.1.4	65.1.1.184	LANforge	1572	Seq: 52490752
2949	0.513087000	CompexPt_2a:47:3a (TA)	CompexPt_c0:23:2c (RA)	802.11	54	802.11 Block Ack, Flags=.....
2950	0.513254000	66.1.1.4	65.1.1.164	IPv4	3110	Leaf-1 (25)
2951	0.513290000	CompexPt_26:02:3a (TA)	CompexPt_c0:23:2c (RA)	802.11	54	802.11 Block Ack, Flags=.....
2952	0.513631000	66.1.1.4	65.1.1.160	LANforge	1572	Seq: 68378213
2953	0.513681000	CompexPt_26:c0:3a (TA)	CompexPt_c0:23:2c (RA)	802.11	54	802.11 Block Ack, Flags=.....
2954	0.514032000	66.1.1.4	65.1.1.129	LANforge	4634	Seq: 115458815
2955	0.514055000	66.1.1.4	65.1.1.129	LANforge	4634	Seq: 115458825
2956	0.514068000	66.1.1.4	65.1.1.129	LANforge	4634	Seq: 115458830
2957	0.514081000	66.1.1.4	65.1.1.129	LANforge	4634	Seq: 115458833
2958	0.514121000	CompexPt_26:41:3a (TA)	CompexPt_c0:23:2c (RA)	802.11	54	802.11 Block Ack, Flags=.....
2959	0.516417000	66.1.1.4	65.1.1.132	LANforge	1572	Seq: 102211678
2960	0.516433000	66.1.1.4	65.1.1.132	LANforge	1572	Seq: 102211679
2961	0.516443000	66.1.1.4	65.1.1.132	LANforae	1572	Seq: 102211680

- + Frame 2871: 1572 bytes on wire (12576 bits), 1572 bytes captured (12576 bits) on interface 0
- + Radiotap Header v0, Length 38
- + IEEE 802.11 QoS Data, Flags:F.
- + Logical-Link Control
- + Internet Protocol Version 4, Src: 66.1.1.4 (66.1.1.4), Dst: 65.1.1.178 (65.1.1.178)
- + User Datagram Protocol, Src Port: 37134 (37134), Dst Port: 37133 (37133)
- + LANforge Traffic Generator

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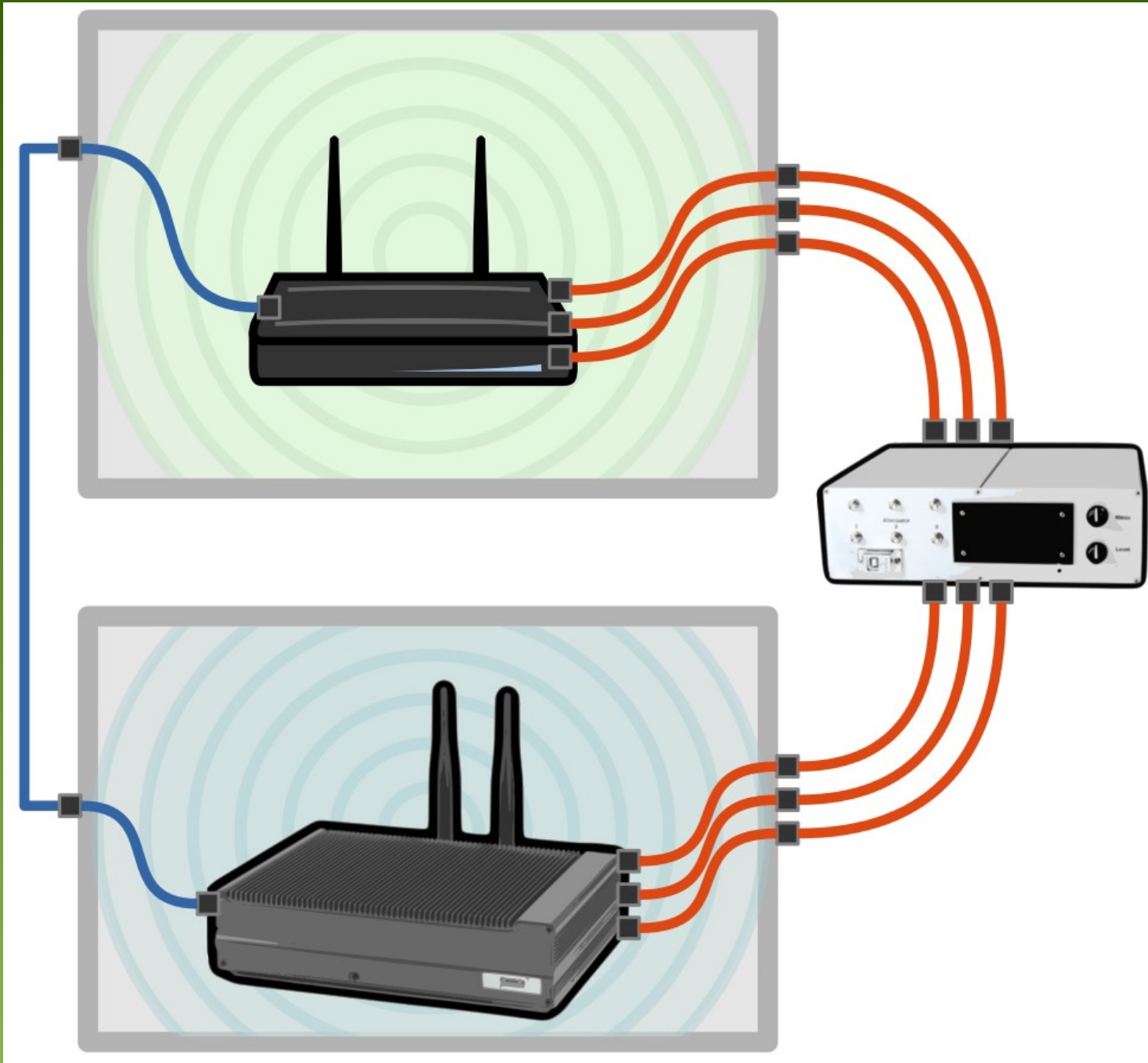
0000  00 00 26 00 2b 48 20 00 dd be e9 ac 00 00 00 00  ..&.+H . .....
0010  00 00 3c 14 40 01 d4 00 00 00 44 00 00 04 22 00  ..<.@... ..D...".
0020  00 00 00 00 00 00 88 02 3c 00 04 f0 21 24 5e 3a  ..... <...!$^:
0030  04 f0 21 c0 23 2c 04 f0 21 c0 23 2c 10 0a 00 00  ..!#,... !#,....
0040  aa aa 03 00 00 00 08 00 45 00 05 dc ed e5 40 00  ..... E.....@.

```

Automated Rate vs Range

- Test rate-control and radio function at different signal strengths.
- Equipment: AP, LANforge, programmable Attenuator
- Optional: 2 Isolation chambers
- LANforge example configuration steps:

<http://www.candelatech.com/cookbook.php?vol=wifire&book=WiFi+Rate+v+Range+Test>



Add/Modify Script

Endpoint Name: Script Type:

Script Name: Group Action:

Enable Script Show Reports Symmetric Loop Hide Iteration Details Hide Legend Hide CSV

Loop Count: Script Iterations: 192 (192) Estimated Duration: 38.4 m (38.4 m)

Script Configuration

Show Dups Show 000 Show Attenuation Hide Latency Distributions Hide Constraints

Run Duration: Pause Duration:

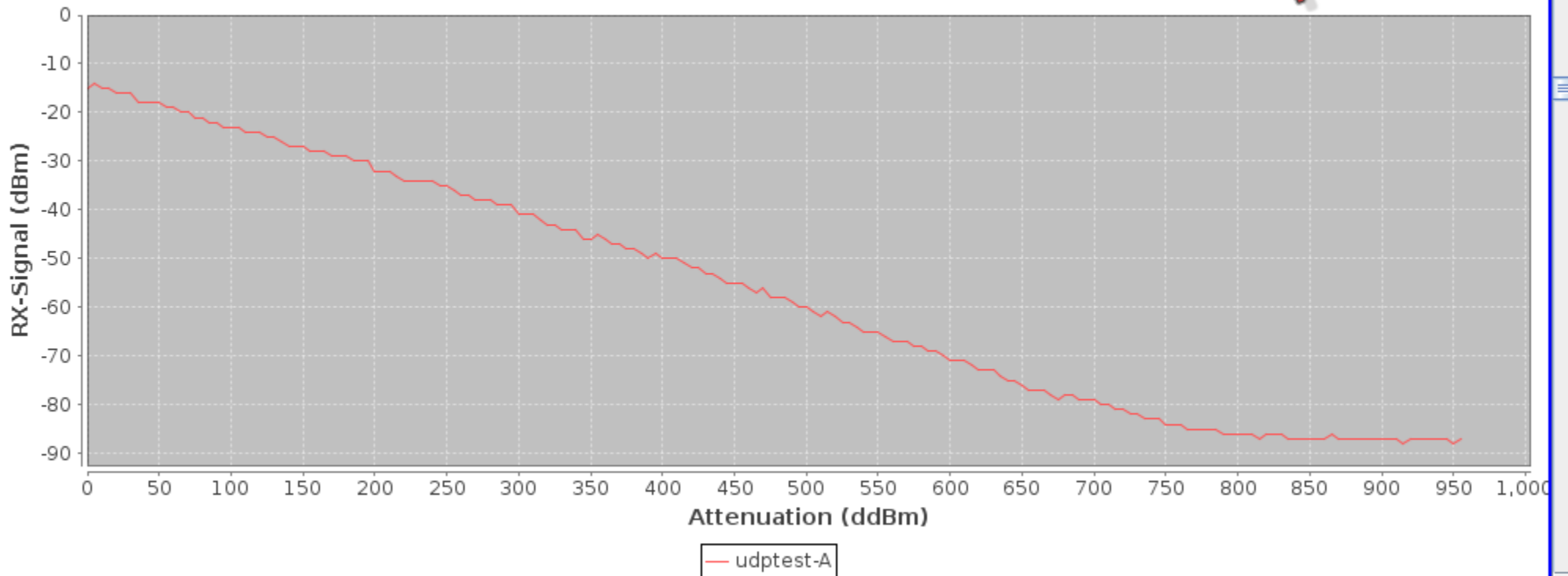
Max Drop Percent: Max-Tx-Underrun:

Max Jitter: Max RT Latency:

Max Failed OK:

Rates A	Rates B	Payload Sizes A	Payload Sizes B	Attenuations (ddBm)
<input type="text" value="bps"/> <input type="text" value="52kbps"/>	<input type="text" value="bps"/> <input type="text" value="400Mbps"/>	<input type="text" value="1472"/>	<input type="text" value="9000"/>	<input type="text" value="1.1.2"/> <input type="text" value="0..+5..955"/>

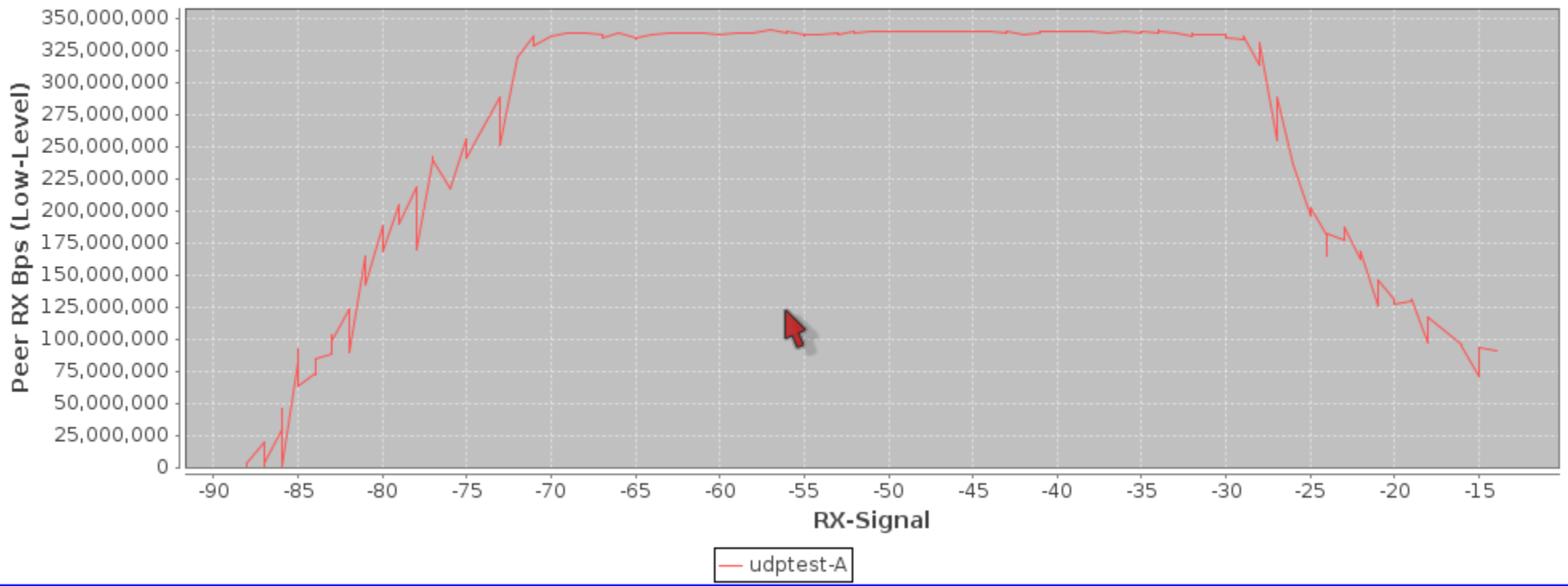
Attenuations v/s RX-Signal for endpoint: udptest-B: Requested Rate: 400000000, PDU Size: 9000



Close

Save File

Peer RX Bps (Low-Level) for endpoint: udptest-B: Requested Rate: 400000000, PDU Size: 9000



Close

Save File